

Good Morning

S43

The Daily Paper of the Submarine Branch

J. S. NEWCOMBE TALKS ABOUT PENICILLIN MEDICINE'S AMAZING "BULLET"

THE latest and most powerful ally to join the United Nations on the battlefields of the world is the drug, discovered by a London scientist, called penicillin.

When you took the mouldy piece of cheese from the mousetrap, you probably thought only of the uncaught mouse.

Actually you saw in that green fungus the greatest miracle of modern times. You were looking at penicillin. It is a miracle in mould.

It is the "magic bullet" that Paul Ehrlich, of Frankfurt, dreamt about a hundred years ago—a drug which, like the antibodies found in us all, would fly straight for the organism and, without harming the patient (that's important!) would kill it while it was at work.

The worker of this miracle ought to be as well known as General Montgomery. But to how many people does the

name of Professor Alexander Fleming mean anything?

It is largely the Professor's fault. He is a shy man, who avoids publicity for himself and hates being photographed.

Way back in 1929, Fleming, who works at St. Mary's Hospital, Paddington, made his startling discovery of this powerful antiseptic.

He was cultivating staphylococci, one of the most dangerous of the microbes, when an air-borne spore settled in the dish and formed a green mould. This accident in itself was common enough—cultures are easily spoilt by foreign bodies.

But this culture was being spoilt in an unusual way. Fleming saw that around the mould the staphylococci were dissolving. Their growth had been checked.

These deadly germs had met their master. Penicillin will inhibit the growth of staphylococci (Fleming didn't know this at the time, of course) in a dilution of 1 in 25 millions, and partially check their growth in a dilution of 1 in 160 millions.

This strength is several hundred times that of the famous M. and B. 693, which the Prime Minister praised for pulling him through pneumonia so rapidly.

Oddly enough, penicillin did not kill the microbes. It merely stopped them multiplying. Germs live only for a few hours, and when they are dead the disease they bring is ended.

Very few diseases, however terrible, kill the patient in a matter of hours. If, with the aid of penicillin, infection can be reduced to "one generation" of germs, then the patient will outlive them and recover.

It is the business of the white blood-cells to attack invading germs, and they will always win unless the germs get an overwhelming number of reinforcements.

The vast curative possibilities of this mould, which is like the green fungus you get on mouldy cheese, must have been at once apparent to Professor Fleming.

He must have pictured it in action on the battlefield. For centuries army surgeons have

written of the difficulty of getting wounds to heal in the presence of infecting bacteria. War wounds are always contaminated by microbes.

Here was the golden bullet indeed! The bullet that would not destroy life, but save it.

But the happy accident in the laboratory was no more the end of the story than Newton's apple was the end of the gravitation theory, or Stevenson's kettle the completed story of steam-power.

On the contrary, the real work—the toil, and the sweat, and the disappointment—was only beginning.

Fourteen years elapsed between the discovery of penicillin and its use on the battlefronts of the Mediterranean.

The first job was to get penicillin in a purer and more concentrated form. The research men prepared a synthetic liquid medium on which to grow the mould. They found that when the liquid was acidified and shaken with ether, the penicillin would pass into the ether.

But they couldn't get the drug out of the ether.

So they decided that penicillin was too unstable to be of use as an antiseptic. For six years the drug was shelved as an interesting but disappointing product of research.

In 1938, Professor H. W. Florey (he was joint winner with Professor Fleming last year of the annual award of the American Pharmaceutical Manufacturers' Association) and Dr. Chain got together a team of research workers at the Oxford School of Pathology.

They were known as "the Oxford Group." They were determined to harness penicillin for the benefit of humanity. They succeeded.

Sufficient pure penicillin was made to carry out a test on mice. The result fulfilled their highest hopes.

A man is something like 3,000 times the weight of a mouse, and it took months to make enough penicillin to use on one man.

The patient was injected with the drug. Professor Florey watched anxiously. The man began to shiver and his temperature rose.

Was this failure? A momen-

tous judgment hung in the balance.

They investigated the cause of the patient's unfortunate reaction. It was due to an impurity easily removed.

Penicillin had won.

Florey went to America and told the American Government all he knew about the drug. Immediately laboratories there started to work. Sixteen firms of manufacturing chemists installed apparatus to make the stuff. Canada and Britain turned over to production.

There was need for hurry. Here was an ally that, by saving thousands of lives on the battlefields, might affect the course of the war.

In the late summer of last year, Professor Florey and Brigadier Hugh Cairns, Nuffield Professor of Surgery at Oxford University, went to join the Eighth Army in Sicily and Italy.

The first soldier to get penicillin was an American who had touched off a mine near Mount Etna. Gas gangrene had set in, and a foot had been amputated.

But immediately penicillin was applied the growing infection was checked. In four days the soldier was recovered enough to be sent to an evacuation hospital. The dreaded gas gangrene had vanished.

Three months later a report was handed to the War Office and the British Medical Research Council.

It told how penicillin had been put directly into the wound instead of into the blood stream. Badly infected wounds were stitched up and the drug was inserted through thin rubber tubes put into the wound between stitches.

Out of 171 cases, 164 cleared up. The men got out of hospital three to six weeks earlier than they used to when other methods were successful.

Out of 23 serious head-wound cases treated by the drug, 20 recovered rapidly and three died.

Florey and Cairns made this modest claim: "There can be little doubt that the prevention of infection with pyogenic cocci (the germs that infect wounds and make them septic) or its control in war wounds is within reach."

Organisms sensitive to the drug are those which cause pneumonia, anthrax, tetanus, diphtheria, gangrene, typhoid, scarlet fever, acute tonsillitis, and meningitis.

When will penicillin be available to civilians? It is impossible to say. "Because it is conditioned by supplies," says Professor Florey, "it is a sort of corpse-raising drug at present."

Every gram is needed for the battlefronts and the military hospitals. They haven't yet settled the penicillin priorities even among the ranks of the badly wounded.

Dr. Julius A. Vogel, of Pittsburgh, U.S.A., claimed recently that he had turned out a crude penicillin at a cost of 3d. a dish, sufficient for twelve treatments. He had a formula by which any layman could make penicillin in the kitchen without special apparatus.

British authorities on the drug replied, however, that it is absolutely necessary to purify it, else you would get all sorts of bacteria, some of which might be deadly.

Medicine and industry are collaborating as never before to find a way to make penicillin synthetically and open a new epoch for suffering humanity.

Beneath The Surface

With AL MALE

I HAVE just read a story in which members of the American Air Force have vouched for the fact that their prayers have been answered, when the odds against them were so overwhelming that all hope of escape seemed cut off.

Had they NOT been saved, their stories would obviously have gone with them.

In danger, we humans always fly to a something, which at that time we believe to be greater than that danger, and capable of helping us out of it... we may call it God or what we like.

Normally, most of us leave this power out of our reckoning, imagining that we ourselves are perfectly capable of steering our own course and avoiding all the rocks, currents, and quicksands of life; only to find, like erring children, that our calculations have gone wrong and that if something doesn't help us we are well and truly sunk.

In that moment of danger we even go so far as to cry to a Heavenly Father and ask for parental protection.

Say what we will, we ARE children of a Creator, and that same Creator is creator of everything in the universe... creator of all things, great and small.

You may say that forces govern... that everything on this earth is composed of atoms held together by certain forces, and so on, right through the universe and all its worlds.

Well... granted that, there surely MUST be a guiding force, or there would be chaos... something would become stronger or more developed than something else and would cause an upset... yet nothing like that happens.

The sun does not decide to work at nights instead of days (it works ALWAYS, of course, but one naturally refers to one particular part of the earth served, and where the sun shines it must be daylight), nor does it run amok, burning up everything.

Neither does this earth of ours take a tour on its own, outside its orbit, just by way of being independent or curious.

Seedtime and harvest, night and day, sunrise and sunset... these things happen according to plan, NOT according to luck, and what similar miracles happen on the millions of other worlds we simply cannot imagine... all these are subject to the ruling of one "something"... call it what you will.

And all these vastnesses dwarf mankind to insignificance... yet... mankind has something over them all... he has a mind... he can think... he can express his thoughts in speech and action... he himself is a marvel of Creation.

Well, then... we presume that the power behind all these forces is a "Master Force," even if we do not give it a mind.

Surely there is no reason to suppose that the creator of the human mind hasn't even got a mind of its own... could mere force, no matter how powerful, create anything BUT forces?

Can mere force produce deli-

cate beauty... could a controlling force possibly allow of a freedom of thought which might oppose it... if that controlling thought had not a mind capable of greater thought enabling it to keep control.

Just as surely, that is why, frail, insignificant mortal mind flies instinctively to the Master Mind when it becomes fearful of being overcome by forces greater than itself.

It flies to the Mind which it believes is greater than overwhelming forces... the Mind which can protect and even rescue it, because it controls EVERYTHING.

But it doesn't do it until brought face to face with DANGER.

Danger of being destroyed by something which at the time appears greater than the individual.

Seems strange that danger brings a realization of helplessness... of a need for guidance and protection, quicker than anything else.

When the human realises his limitations he seeks the help of the "LIMITLESS," and wants to claim his birthright... his relationship with the power greater than the danger... in other words... the Almighty.

Then he even cries out, "Father... HELP ME."

In that moment when the stupidity of the human breaks down... when he realises how feeble he is... in that moment of RECOGNITION of relationship... the relationship is established... the Almighty stretches forth His hand... the "Oneness" is established... NOT because the Almighty wasn't looking that way before... but because the scared human had been looking the wrong way all

the time, until he realised his limitations... THEN

when he acknowledged his helpless condition and admitted (even to the extent of crying out) the saving grace of the Omnipotent... THEN he avails himself of the protection which was there all the time.

"Lo, I am with you ALWAYS... even to the ends of the earth."

One of the American pilots (one of very many) who had come through the fiery furnace and called "on the Lord," as he put it, in his moment of danger, found a completely new angle on life.

This is what he said: "He (the Lord) has taken that sinking feeling away, that I used to get. I'm careful, but I'm not scared any more. He'll see me through all right."

"And how about after the war?" he was asked. "Do you think you'll forget?"

"How can I forget?" he answered slowly. "He's my best friend, isn't He? Well—He's going to STAY my best friend."

Seems that that boy, and millions more, have got something.

We cry out for Divine protection when in danger... why not claim it oftener, when NOT in danger?

Because, if we believe that power is there when we are threatened, surely we cannot deny that it is ever-present, because somewhere some lost soul is ALWAYS claiming it. Cheerio and Good Hunting.

D'YOU KNOW WHY THE NAMES?

WHY do we call a turkey a turkey—when the bird originates in Mexico? Why is a Welsh Rabbit? Or a turtle-dove?

Why do we have bull thistles, when bulls shun their prickles—or why the horse-radish, a plant of which horses are not specially fond?

Behind the commonest words lies confusion—or sometimes just a plain boner. The turkey, for instance, got all mixed up at first with the guinea fowl of the Turkish Empire.

Guinea fowl, in turn, are not worth 21s., nor do they come from Guinea; even the dictionary experts confess they do not know how the name occurred.

Even the Song of Solomon made a mistake when it declaimed that the voice of the turtle was heard in the land. The turtledove was really called the turtur, from the soft sound of its voice.

Names prefixed by the term "horse" and "bull" were originally given by comparison to anything large or coarse, hence bullrush, bullfrog, horse-radish and horseweed.

Yet, just to confuse you, catnip really does get its name from its appeal to cats.

Welsh rabbit used to be a Welsh rarebit. Jam tart is sweet rather than tart, but a jam tartar would cling to the sides of a barrel just as long as jam does in a pastry.

Yet glass snakes are really lizards, the dog-berry is bad for dogs, but fleabane and henbane are not much of a bane to fleas and hens.

Baffing? You'd think that scientific words at least would be correct, yet "vitamin" is already a mistake. The chemists who first discovered these substances thought that they belonged to a group of known compounds, the amines.

Being shown as necessary to life, they were accordingly named "vita-amines." And now we know that some vitamins are not amines.

Robert Hooke, too, was wrong when he first saw the microscopic make-up of a piece of cork and called the tiny composing units "cells" because they looked to him like little rooms. To-day we recognise that living cells at least are not box-like, hollow things—but the mistaken name persists.

The air-raid siren, similarly, is just on the dangerline of changing from fact to error.

When Cagnard de la Tour invented a machine which revolved perforated discs and produced sweet, clear sounds, he named it after the classical sirens whose singing had lured sailors to destruction.

The air-raid siren as we know it, still operates on de la Tour's disc principle. But are its sounds still "sweet"?

There are appropriate names—such as the woodpecker and potato bug—but lots of inappropriate ones. The blackbird really IS, but the bald eagle is merely white-headed.

But before I get myself in deep, I'll turn the argument over.

AND WHY "PICCADILLY" ?



Richard Keverne asks
DOES LEAP YEAR MEAN
YOUR CLOCKS
ARE WRONG?

THIS year—1944 is yet another Leap Year. The calendar people will shove in the usual extra day at the end of February, and everything will carry on serenely just as it always does. But for the life of me I cannot understand how they work this Leap Year business.

When I ask, I am told vaguely that the calendar doesn't keep time quite accurately, and to regulate it, so to speak, you have to put in this extra day every fourth year, or after a bit we should find ourselves having Christmas in October and Easter Monday somewhere about Midsummer Day, or something like that.

I never can understand it, and I don't think other people can, either. So I try to work it out for myself.

And this is as far as I can get. I hope you can follow me. We must have an extra day every four years to keep the calendar straight. That's admitted.

LEAP YEAR LEAPED. But in practice that doesn't

HERE'S
ANOTHER
"TRUE GHOST
STORY" By
J. S. Newcombe
BULLY

SHRIEKED AT SAMPFORD
PEVERELL

THE spook of Sampford Peverell, a village near Tiverton, in Devon, does not confine itself to a single "haunted room." Ever since its first "appearance" in April, 1810, in the house of Mr. John Chave, it has wandered about the rooms at all hours of the night and day. It has attacked the occupants with such violence that they have shown the physical results, in bruises and swellings, for weeks after. The truth of the super-

natural manifestations was vouched for by the Rev. Caleb C. Colton, Vicar of Kew and Petersham, who at one time lived at Sampford. In 1810 he published his "Narrative of the Sampford Ghost."

At mid-day, it was said, the ghost announced its approach by terrifying knockings in some apartment or other of the house.

The vibration of the floorboards caused by these repeated blows could be felt through the soles of one's boots, and the dust thrown up was thick enough to make the eyes smart.

Mr. Colton came to stay in Mr. Chave's house, and on the first night the servants, who slept in two rooms at the top, were dreadfully beaten up by the invisible agent. More than two hundred blows were counted by the Vicar as he lay in bed.

BEDSIDE BRUISER. One of the servants, named Ann Mills, emerged from the fray with a swelling on her cheek as big as a turkey's egg. She stated on oath that she was alone in bed when invisible hands struck her savagely.

Two others, Mrs. Dennis and Mary Woodbury, had been battered into numbness.

After this unholy experience the servants moved their bedding into Mr. and Mrs. Chave's room.

They had been quiet about half an hour, with the light extinguished, when a large iron candlestick began to move rapidly about the room. Mr. Chave could hear no footsteps, but while attempting to ring the bell and rouse the rest of the house the candlestick was thrown violently at his head.

Mr. Colton did hear footsteps. They walked past him, then round him. He could feel the heat of burning candles.

The next night the invisible ghost came into Mr. Colton's room. There were four heavy, cotton curtains to the bed.

keep it quite straight, because every hundred years or so you don't have a Leap Year Day in one Leap Year to correct the correction.

Even then you don't get absolutely right, but I am told the margin of error there won't need adjusting for thousands of years, so that needn't worry you and me.

Let's come back to the ordinary Leap Year Day every fourth year.

Now, there are twenty-four hours in a day, so it would seem to me that if we're twenty-four hours wrong in four years, we must be (fours into twenty-four go six) six hours wrong each year.

Obviously we can't shove the six hours on every year, or you'd have the clock all over the place, so we wait until we've got a complete day before we do the adjustment.

There's nothing wrong with the argument yet so far as I can see. We'll carry on, then.

Now, the last time we put the calendar right was in February, 1940. The calendar people shoved in their extra day, February 29th, and, as I see it, we started all square on March 1st.

Since then we've been going wrong again every day, tick by tick of the clock.

Let's do another sum. I am trying to get this clear.

Six hours a year, with twelve months to the year, means half

an hour a month, as near as doesn't matter.

So where are we now? We've come to the problem that has me completely beaten. Since the 1st of March, 1940, to the time of writing, three years and just over five months have passed.

CLOCK TWISTER. Here's another sum: Three years at six hours to the year equals eighteen hours. Five months at half an hour to the month equals two hours and a half. Eighteen hours plus two hours and a half equals twenty hours and thirty minutes.

Therefore, as I write the time is twenty hours and thirty minutes wrong. I'm not quite sure which way—fast or slow—but, anyhow, at the moment it ought to be either about half-past eight to-morrow morning, and I'm eating my breakfast, or half-past three yesterday afternoon and I'm having a tooth filled at my dentist's.

But it isn't. It's just after twelve o'clock noon to-day, and I'm writing this here.

I can't see anything wrong with my argument and calculations.

When I put this problem up to learned professors and persons, they brush it aside and say Leap Years have to do with the moon. They never tell me what.

All I can understand is that if you monkey with the calendar at the rate of six hours a year, what I say is right.

Where's the catch?

In the candle-light he saw the curtains stir. Their motion increased, until the knots were thrown and whirled about with such violence he was anxious for his own safety.

This lasted for about two minutes, and concluded with a noise resembling the tearing of linen. Upon later examination a rent was found across the grain of one of the curtains.

Mr. Colton made a voluntary affidavit before the Master-in-Chancery, at Tiverton, declaring that he had placed a seal with a crest on every door and cavity in the house.

The landlord of the house, a Mr. Talley, was anxious to sell the property.

Accordingly, he pretended to have solved the mystery of the visitations by alleging that the noises had been produced by a cooper with a broomstick and a bludgeon.

He maintained that Mr. Chave wanted to purchase the house cheaply, and had employed this means of reducing the price.

It served to draw down the wrath of the people of Tiverton on Mr. Chave's head, and he narrowly escaped with his life.

"I myself," wrote Mr. Colton from his vicarage at Kew, some three years later, "who have been abused as the dupe at one time and the promoter of this affair at another, was the first to come forward with one hundred pounds, and the Mayor of Tiverton has now an instrument in his hands empowering him to call on me for the payment of that sum to anyone who can explain the cause of the phenomena."

The money was never claimed.



And all my wife thinks of is dress, dress, dress!

Ever heard of
TRIAL
OF PYX?

ONCE every year there is a ceremony in London that is perhaps the most ancient in Britain. They call it the Trial of the Pyx, and it takes place in the Hall of the Goldsmiths' Company.

The Trial is simply a test of all money that has been made at the Mint and at the Empire's branch mints in Africa, Australia and elsewhere, in order that the coins may be proved of the correct weight and size.

The ceremony has been held for centuries. In the Middle Ages it was customary for the King's Moneyers to mutilate coins for their own profit, and so the Trial was established.

It dates back to the time of Edward the Confessor, and was at one time held in the Abbey of Westminster.

Indeed, the chapel, or Chamber of the Pyx, is still in existence in the building, and it was there that the Royal regalia was kept.

The Pyx itself is a box. At the beginning of the year—sometimes in March—samples of the coins made during the recent months are taken by officials of the Mint and placed in the Pyx. The coins are chosen by chance.

One gold coin (when coins were gold) was taken out of every 15lb. minted, and one from every 60lb. of newly coined silver. These were put into the box and taken to the Hall of the Goldsmiths' Company.

THIS ELEPHANT PREFERS BACH

MANY of the popular ideas about wild creatures are more picturesque than true, but the intelligence and memory of the elephant are well-proven facts.

Did you ever come across this story in your school books?

A circus elephant, parading through a town, playfully thrust his trunk at a tailor sewing in front of his shop. The tailor playfully replied by pricking the trunk with his needle.

Some years later the circus returned. As the parade drew abreast the tailor's shop the elephant filled his trunk from a puddle in the roadway and blew a stream of dirty water over the tailor and his goods. Account settled!

We schoolboys were told that the story was "a bit exaggerated." I believe it could be absolutely true.

But true only, of course, of the Indian elephant. The African fellow has a wild, un-

Solution
to Puzzle
in
S. 42

M	O	R	R	O	W
A	L	P	I	N	I
U	N	E	V	E	N
R	E	N	O	W	N
I	L	I	N	D	I
C	R	I	T	I	C
E	M	B	A	R	K

SUNDAY FARE



WHAT IS IT?
Here's this week's Picture Puzzle. Last week's was: Coffee Beans.

There is a jury consisting of freemen of the City, representatives of the Treasury and Board of Trade; and there is the official known as the King's Remembrancer. He is dressed in full robes of his office. He is the judge.

It is the duty of the jury to weigh and assay the coins and to compare them with the standard ones. Solemnly, if such is the case, the coins under examination are pronounced "Good."

The Remembrancer then reports on the result to the Treasury. After that the London Gazette records the result of the Trial.

But this is not all just tradition. The report, the trial and the entire procedure is held to be so important that it is governed by an Order in Council.

Nowadays, however, there are no gold coins. If the Mint made any it would cost nearly twice the nominal value of a sovereign to make one. There have not been any gold coins since the year 1933, which was a condition of affairs then without parallel.

In that year the Deputy Master and Comptroller of the Mint, Sir Robert Johnson, stated that the whole of the gold produced in the previous 500 years could be packed into a 40ft. cube.

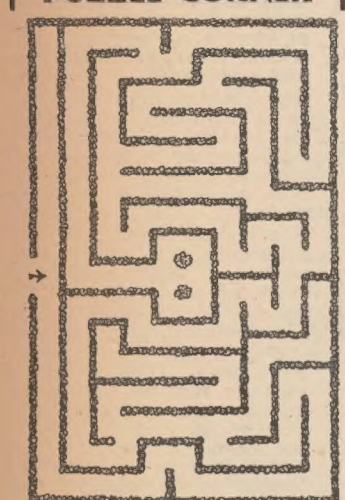
DEATH SENTENCE. Not very often have mistakes in coins been found at the Trial of the Pyx. But they have been found. On one occasion an Australian minted sovereign was "condemned to death" because it was in excess of the standard weight.

In Queen Victoria's reign, a sovereign, one of a consignment of nearly £100,000, was sent to New Zealand, and then returned because it was so badly stamped. The impression of the Queen's head was only half visible.

As for silver coins, hardly one in 200 is rejected. This is because the mechanical appliances now in use are so accurate, and there are over a sixty weighing machines at the London Mint alone. These weigh the coins at every stage, from the thin metal strip to the final, polished coin.

PETER PRENDERGAST.

PUZZLE CORNER



HAMPTON COURT. This is the famous Hampton Court Maze (altered a little in shape only), and many visitors get lost in it every year. You start at the arrow and find your way to the two trees in the centre, and some old guide-books give an infallible clue to follow. The problem here is to discover the clue. What simple way is there of remembering the way in and the way out? (Answer in S.44)

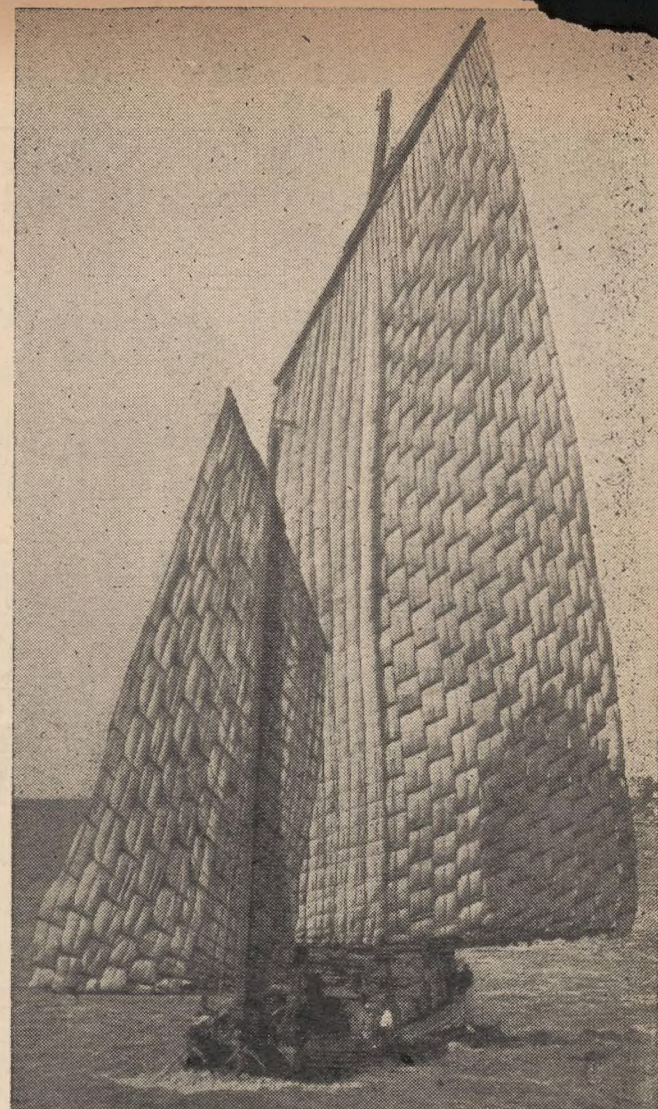
Good Morning

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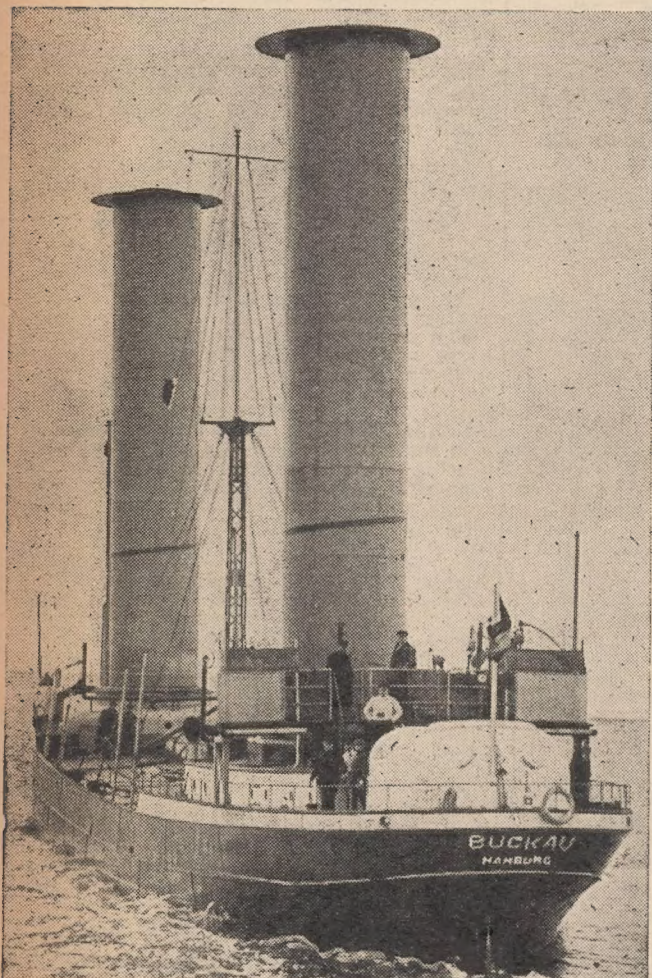
Floating peacefully in seven ways



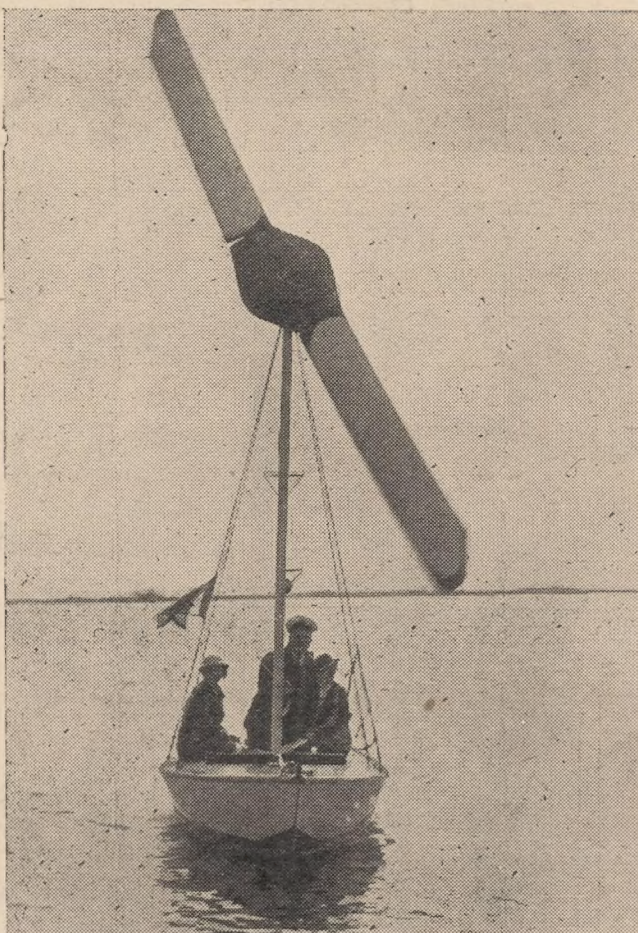
Procession of gondolas at the inauguration of the new Campanile, Venice.



A Chinese junk under full sail, a pretty sight now all too rarely seen in this land of quaint beauty.



The Flettner Rotor Ship, "Buckau," nearing the end of her test trip from Danzig to Scotland.



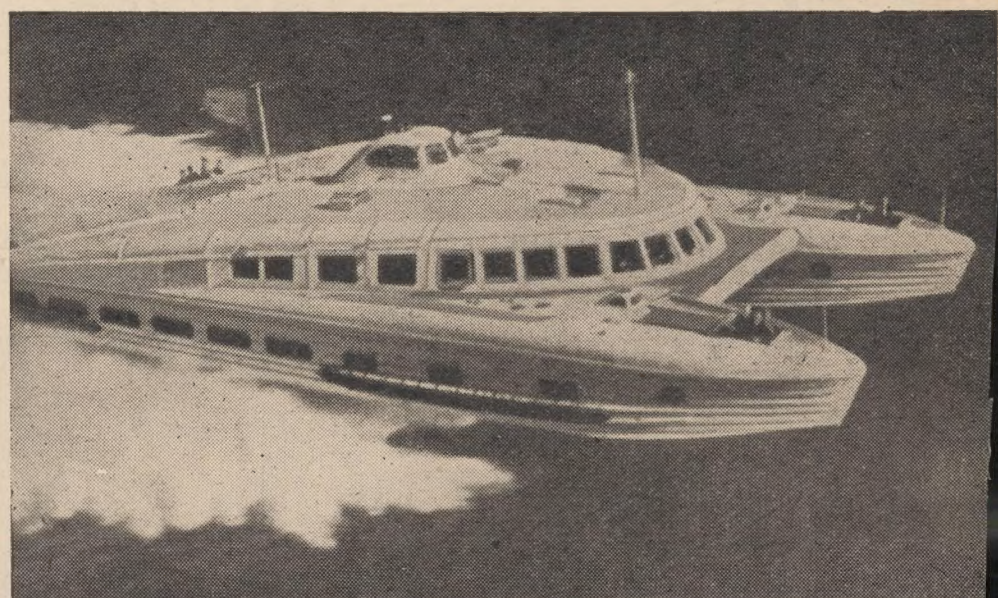
"Plane sailing" in the gyro boat, during a trial run on the Delaware river, U.S.A.



Returning home after salmon fishing. Coracle fishers on a river in Carmarthenshire, N. Wales.



Gravel-pit explorers. Tar barrels and timber provide the "cruiser" for these boys during a holiday afloat.



The Sea Express, carrying 200 passengers at 60 m.p.h. from Sochi to Sukon, Black Sea.